

SUSPENDED SCAFFOLDING **IN CONSTRUCTION**

COURSE OUTLINE

- **It's a simple fact... in order to do your job, you first have to get to where you work.**
 - Some people take a flight of stairs.
 - Others use elevators or escalators.
- **But what if your job requires you to work suspended in mid-air... 30 feet up?**
 - In that case you need something much more "specialized" to get there... like a scaffold.
- **When you are working high above the ground on structures like scaffolds, safety is especially important.**
 - In fact, scaffold safety is such a critical issue that OSHA has developed regulations specifically dealing with working on scaffolds.
 - While there are many kinds of scaffolds covered by the OSHA regulations, this program will focus on suspended scaffolds.
- **Suspended scaffolds are made up of one or more platforms that are hung by metal or fiber rope.**
 - The rope allows the platforms to be raised and lowered to reach various work locations.
 - These scaffolds allow workers to safely reach difficult places.
- **Suspended scaffolds are like any other "tool."**
 - There are certain procedures that need to be followed to make sure that no one gets hurt when they are used.
 - That's why workers must be trained on the rules and safety regulations for suspended scaffolds before being allowed to use them.
- **OSHA mandates that this training include:**
 - The proper ways to assemble and take down suspended scaffolds.
 - Their correct use and placement.
 - How to handle materials when working on suspended scaffolds.
 - Fall prevention and protection techniques.

- **Even though workers must undergo this thorough training, OSHA also requires that a "scaffold expert" be on site at all times whenever scaffolding is being used. This expert is responsible for:**
 - Designing each scaffold that is erected at the site.
 - Supervising scaffold construction.
 - Enforcing scaffold safety regulations.
 - Resolving any problems that relate to scaffolds.
- **There are a number of hazards that you have to be concerned about when working with scaffolds.**
 - It is important to check the area where your scaffold will be used before you even begin setting it up.
 - Look for things that could block the scaffold's path while it is in motion.
 - Protruding objects like pipes and construction equipment could very well tip the scaffold as it passes by.
- **Electrocution can also be a hazard when you are working on a suspended scaffold.**
 - Make sure you are a safe distance from all electrical sources.
 - Be especially aware of any nearby power lines that could come in contact with the scaffold.
 - The rule for working near power lines is the higher the voltage, the further away you should be.
 - Ask your supervisor about how far away you should be from any lines around your work site.
- **After your site has been inspected for obstructions and other hazards you can move ahead with hanging a scaffold.**
 - A scaffold expert will decide which "suspension device" will best fit the structure that you are working on.
- **There are a number of suspension devices to choose from, including:**
 - Cornice hooks.
 - Parapet clamps.
 - Roof irons.

- **These devices must be attached to parts of the structure that are strong enough to support four times the "maximum intended load" of the scaffold.**
 - OSHA defines the maximum intended load as "...the total weight of a scaffold, including an estimate of all persons, equipment, tools and materials that can be applied to a scaffold or scaffold component at any time."
 - All suspension devices must be made out of wrought iron, steel or a material equal in strength to these metals.
- **When there are no points on the structure that can support a suspended scaffold, "outrigger beams" are used.**
 - These beams are anchored to bearing supports within the structure, and extend the scaffold out and away from it.
 - For best results, outrigger beams should be placed perpendicular to their supports, unless it is determined by a scaffold expert that it is safe to attach them at a different angle.
- **The beams should then be stabilized with ropes known as "tie-backs."**
 - Like the scaffold, the tie-backs must be strong enough to support the maximum intended load of the scaffold.
 - They should be securely anchored to bearing supports, like a building's "I-beams" and girders... not things that could give way, like vents, pipes or electrical conduit.
- **To further stabilize the outrigger beams, "counterweights" should be attached.**
 - This creates a balance between the weight of scaffold and the weight of the beam.
 - But be sure to only use weights that are designed specifically to act as counterweights.
 - Don't use construction materials, because other workers might think they are available for their "normal" use, and remove them from the beam.
 - Make sure the weights you do use are securely attached to the outrigger beams, so they don't shift or fall off, which would also unbalance the scaffold.
- **Once the suspension devices are in place, you will need to install either metal or fiber ropes, which will be used to hang the scaffold.**
 - These ropes are your "lifelines," and you need to make sure that they are in top working condition at all times.
 - You should inspect them for damage and wear before, during and after each use.

- **Replace the ropes immediately if you find any damage that could reduce their strength, such as:**
 - Tears.
 - Gouges.
 - Frayed strands.
- **Ropes must also be replaced if they have lost one-third of their original diameter at any spot, which can happen through:**
 - Exposure to the heat of welding torches.
 - Contact with electrical sources.
 - Abrasions.
 - Corrosion.
- **You can have other problems with ropes, as well.**
 - Kinks can make it difficult for a rope to smoothly travel through a hoist while a scaffold is being raised or lowered.
 - This could cause the scaffold to bounce, or become unbalanced, making it unsafe for workers.
 - So kinked ropes should be replaced as well.
- **Ropes also need to be replaced if they go through any high-speed braking situations.**
 - These occur when there is a sudden change in the speed of a rope as it travels through a hoist.
 - Quick changes in a rope's speed are warning signs that the scaffold may be falling.
- **If a change in speed is detected, the hoist's secondary safety brake will be triggered to stop the scaffold's descent quickly and smoothly.**
 - But when a secondary brake engages, it puts so much strain on a rope that it may be unsafe to use the rope again.
- **Once you have determined that the ropes are in good condition, they can be fixed to the scaffold's hoist.**
 - But remember, if you are using a powered hoist to move your scaffold, it must have an electric or air-driven motor.
 - Gas-powered motors are not permitted, since they are considered a fire hazard.

- **Whatever types of hoists you are using, test them to make sure that they are in safe working condition before you begin to work.**
 - A hoist must also be able to safely support, decelerate and stop a load during a fall.
- **Once the hoists have been tested, they are ready to be attached to the suspension ropes (which allows the scaffold to travel up and down the side of the structure).**
 - Always check with your scaffold expert to make sure that you have enough rope to safely reach your destination.
 - You don't want to run out while you are raising or lowering the scaffold.
- **Related hardware must support up to six times the scaffold's maximum intended load.**
 - Since the ropes attach to the hoists, the hoists must support six times the maximum intended load of a scaffold as well.
 - Understanding these load capacities is important, because you rely on ropes and hoists to support you while you work.
 - If you have any questions about the load capacity of the scaffolds, ropes or hoists you are using, talk to a scaffold expert before you begin work.
- **But ropes and hoists are just part of the scaffold picture.**
 - You also need a sturdy platform to stand on.
- **Platforms should be wide enough to:**
 - Allow workers room to store their tools.
 - Permit people to move around and pass by each other as they work.
- **One type of suspended scaffold that doesn't require room for walking is a "boatswain's chair."**
 - Boatswain's chairs are suspended from ropes.
 - They are designed to support only one worker, in a seated position.
 - The worker can sit on a board or in a sling made from fiber or synthetic material.
- **If a wooden plank is used as a chair's seat, OSHA requires that it be no less than 12 inches wide by 14 inches long.**
 - It must be at least one inch thick, to be strong enough to support the weight of an average worker.

- **When suspending a boatswain's chair, either a fiber or wire rope must be used.**
 - If fiber rope is used, it has to be at least 5/8 of an inch in diameter.
 - Since wire rope is stronger, OSHA only requires it to be 3/8 of an inch in diameter.
 - Because heat can burn and weaken a fiber rope, wire rope should always be used whenever you are working on any project that involves a heat-producing process, such as welding.
- **No matter what type of suspended scaffold you work with, one safe work practice you should always follow is to do a full inspection before each use.**
 - Check to see that components have not been worn or damaged, and that the scaffold is not overloaded.
 - If you discover any problems, report them to your supervisor immediately.
- **Another work practice that can help to keep you safe is limiting the build-up of tools and other debris on a scaffold platform. Debris can be kept to a minimum by:**
 - Throwing away trash that has accumulated on the platform at the end of your shift.
 - Putting tools away as you finish using them.
 - Not allowing excess work materials to be stored on the platform.
- **Not only will this relieve "stress" on the scaffold, it will help reduce the number of slips, trips and falls that occur as well.**
- **"Think before your reach" is another safe work practice that is very important when you are working on a scaffold.**
 - If you are trying to get to a work area that is a little high... or low... raise or lower the scaffold.
 - Don't test your balance by leaning or stretching to reach your work.
- **Leaning against the structure you are working on can create a dangerous gap between the platform and the structure... or even push the platform out from under you.**
- **Stretching to extend your reach by standing on things such as bricks, barrels and boxes is also dangerous.**
 - These materials are not sturdy and can easily slip from under you.

- **Since falling is one of the main concerns when working on a suspended scaffold, "personal fall arrest systems" (PFAs) should be used by everyone who is working on a scaffold.**
 - PFAs work by slowing down, then gently stopping a fall.
- **Personal fall arrest systems consist of:**
 - An anchoring device that is connected to a supporting structure.
 - A full-body harness.
 - A deceleration device.
 - A lifeline.
- **PFA lifelines that are used on suspended scaffolds must be separate from the ropes that suspend the scaffold platform itself.**
 - Lifelines should only be attached to a "structural member", like girders or "I-beams", that can withstand the weight of a falling worker.
 - PFA lifelines must not be attached to the scaffold or the suspension ropes.
 - If the scaffold falls, it could pull the person at the end of the lifelines down with it.
- **Another danger in connecting lifelines to a scaffold is that a falling worker could pull the scaffold... and everything on it... down with them.**
- **It is also important that lifelines extend far enough to allow freedom of movement.**
 - If they don't, they should be repositioned immediately so that they are attached to another structural member closer to the scaffold platform.
 - Lifelines also need to be able to swing clear of physical hazards like tools, debris or other workers.
- **Pay particular attention when you are raising or lowering a scaffold, making sure that lifelines are clear of all obstacles.**
 - Above all, never disconnect yourself from your lifelines while you are on a scaffold.

- **Because falling is such a problem when work is done with scaffolds, even with PFAs guardrails should be installed on most suspension scaffolds before workers are allowed to get on them. OSHA requires that the guardrails:**
 - Be installed between 39 and 45 inches above the walking surface of a scaffold.
 - Have a top and middle rail.
 - Be strong enough to withstand the force of an average worker falling onto them.
- **People aren't the only things that can fall from a scaffold.**
 - Objects such as tools, building materials and debris can also "hit the deck".
 - This is where "falling object protection" comes into play.
 - Everyone on the job site needs to take an active role in making sure that nothing falls from a scaffold they are working on.
- **In addition to following good work practices, using preventative measures like toe-boards, screens and debris nets can be a big help.**
 - Toe-boards form a protective lip around the edge of a platform, and help prevent objects from sliding or being kicked off a scaffold.
 - Screens and debris nets hang beneath platforms to catch falling objects before they can do any damage.
- **But if there is the potential for extremely heavy objects to fall, screens and netting will not be sufficient.**
 - In these cases, the area below the danger zone should be roped off to protect people from possible injuries.
 - You can help to protect yourself from falling objects by wearing a hard hat.

*** * *SUMMARY* * ***

- **Whenever you are working on a scaffold, protecting yourself is your number one responsibility!**
 - OSHA has made sure that you will receive good safety information and training.
 - But you have to do your part as well.
- **Be sure to set up your scaffold suspension devices correctly.**
- **Remember to use counterweights if they are needed to help support the scaffold.**
- **Make sure that you "know your ropes" ... and how to attach them to the equipment you are working with.**
- **Keep your scaffold free of unused tools, materials and other debris.**
- **Use guardrails and PFAs to protect yourself from falling while on the job.**
- **When you work on a suspended scaffold, gravity is always a concern.**
 - But if you follow the rules and safety precautions, you can avoid letting it "get you down."
- **You should always be ready to "rise to the occasion" when you are working with suspended scaffolds!**